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AFRICA RISING - Enhancing partnership among Africa RISING, NAFAKA and TUBORESHE CHAKULA Programs for fast tracking delivery and scaling of agricultural technologies in Tanzania Quarterly Report

Quarter – 01 April, 2017 – 30 June, 2017

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IITA Transforming African Agriculture 50 1967 - 2017

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Cover photo
A QDS rice farmer in Kilombero district inspecting his rice crop. Photo credit: Filbert Mzee/ACDI VOCA.

I. ACTIVITY OVERVIEW/SUMMARY

Activity Name:	AFRICA RISING- Enhancing partnership among Africa RISING, NAFAKA, and TUBORESHE CHAKULA Programs for fast tracking delivery and scaling of agricultural technologies in Tanzania
Activity Start Date:	1 October, 2014
Activity End Date:	30 September, 2017
Name of Prime Implementing Partner:	International Institute of Tropical Agriculture (IITA)
Contract/Agreement Number:	BFS-G-11-00002
Name of Subcontractors/Sub awardees:	Agricultural Research Institute, Dakawa/Chollima International Maize and Wheat Improvement Center (CIMMYT) World Vegetable Center (WorldVeg)
Major Counterpart Organizations	• International Center for Tropical Agriculture (CIAT) • World Agroforestry Center (ICRAF) • Agricultural Research Institute, Hombolo • Agricultural Research Institute, Selian • Kilombero Agricultural Research and Training Institute (KATRIN) • Horticultural Research and Training Institute (HORTI)-Tengeru • District Agricultural Councils • Meru Agro-seed Company and Consultancy • Aminata Agro-seed company
Geographic Coverage (Districts, Regions, and/or Zanzibar)	• Babati and Kiteto Districts (Manyara Region) • Kongwa District (Dodoma Region) • Kilombero, Ifakara, Kilosa, and Mvomero Districts (Morogoro Region) • Iringa rural and Kilolo Districts (Iringa Region) • Mbarali and Mbeya Rural Districts (Mbeya Region) • Mbozi District (Songwe Region)
Reporting Period:	01 April, 2017 – 30 June, 2017

1.1 Executive summary

During the reporting period, 18,637 new farmers (9,939 male, 8,698 female) were trained in good agricultural practices associated with maize, rice, legumes, and vegetables as well as postharvest and aflatoxin management. In addition, 45 local artisans (44 male, 1 female) were trained in the management of shellers, threshers, and weeders so that they could provide services for these mechanization technologies introduced by the project. In addition, 40 Government extension staff (34 male, 6 female) were trained on data management and aflatoxin management. Field days were also organized in eight of the eleven project districts with 3,611 participants (1,902 male, 1,709 female).

Challenges encountered were (i) lack of an active climate preparedness strategy at national level as exhibited by water stress resulting from poor rainfall distribution in the current planting season; (ii) expectation by participants in some villages to be paid for training attendance; and (iii) delays in getting approval and registration of the Aflasafe product for aflatoxin management which have stifled efforts to take it to scale despite the interest it has aroused among farmers.

The key planned activities for the next quarter are as follows: (i) training of farmers in maize production (districts that experienced late rains), vegetable production, soil and water conservation. and postharvest management; (ii) farmer field days; (iii) annual outcome survey and yield data collection; (iv) end-of-project phase review meeting; and (v) project planning meeting.

1.2 Summary of results to date

Indicators *List all indicators per IR and indicate in brackets whether it is a standard or custom indicator. Indicator definitions should go in the Annex.*	**FY 2016-2017 Annual Target**	**Q1 FY16/17**	**Q2 FY16/17**	**Q3 FY16/17**	**Q4 FY16/17**	**Achievements FY 16/17**	**Percentage Achieved FY17 (%)**	**LOP Target**	**LOP Achievements to Date**	**LOP Percentage Achieved (%)**
EG.3-1: (4.5.2-13) Number of households benefiting directly from USG interventions (RAA)	47,000	9,255	36,126	13,046		49,172	104.6%	47,000	51,168	108.9%
EG.3.2-1: (4.5.2-7) Number of individuals who have received USG-supported short-term agricultural sector productivity or food security training (RAA) (WOG)	47,200	2,526	42,364	18,722		61,086	129.4%	47,200	62,190	131.8%
EG.3.2-4: (4.5.2-11) Number of for-profit private	200	179	196	231		231	115.5%	200	231	115.5%

enterprises, producers' organizations, water users' associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG food security-related organizational development assistance (RAA) (WOG)										
*EG.3.2-17: (4.5.2-5) Number of farmers and others who have applied improved technologies or management practices with USG assistance (RAA) (WOG)								47,000	10,345	22.3%
*EG.3.2-18: (4.5.2-2) Number of hectares of land under improved technologies or management practices with USG								58,000	12,952.96	22%

assistance (RAA) (WOG)										

*These indicators are reported annually.

2. ACTIVITY IMPLEMENTATION PROGRESS

2.1 Progress narrative

Africa RISING and our partners are involved in the delivery of agricultural information and technology packages through a network of projects and other public and private sector actors that include the USAID-funded cereals program, NAFAKA. These collaborations are aimed at improving efficiency while contributing to the Feed the Future (FtF) goals of harmonizing regional efforts to fight hunger and poverty in countries with chronic food insecurity and insufficient production of staple crops. Attractive interventions in this project include the introduction of improved crop varieties, dissemination of good agricultural practices (GAPs), rehabilitation and protection of natural resources, and postharvest management.

The project focuses on four crop enterprises (maize, legumes, rice, and vegetables) with postharvest handling and nutrition as cross-cutting themes. The key partners in the project include international agricultural research centers: IITA, CIMMYT, CIAT, ICRAF, the World Vegetable Center, and one USAID-funded cereal crops project: NAFAKA (ACDI/VOCA). These work in partnership with national agricultural research institutions (ARIs) such as Dakawa (that leads the rice theme), Selian, HORTI-Tengeru, and Kilombero (KATRIN). Local government institutions, specifically DAICOs, the private sector (seed companies, millers, and processors) and NGOs are also part of the project implementers to deliver on the following objectives:

1. Introduce and promote improved and resilient varieties of food crops to farm households in a manner that complements their on-going farm enterprises, contributes to sustainable agricultural resource management, and offers nutritional advantages and alternative market channels;
2. Disseminate GAPs along with the most promising new crop varieties suited to widely representative agro-ecological zones and market proximity;
3. Protect land and water resources and foster agricultural biodiversity through the introduction of soil and water management practices;
4. Increase food security and improve household nutrition among the most vulnerable households and their members, especially women and children, by introducing locally adapted and nutrient-rich vegetables;
5. Introduce and promote postharvest management technologies for maize, rice, legumes, and selected vegetable crops to reduce losses and bring quality up to market standards; and
6. Offer and expand capacity building services to members of grassroots farmers' associations, platform partners, and development institutions in the scaling process, paying particular attention to the special opportunities available to women farmers as technical and nutritional innovators and resource managers.

The project is currently being implemented in six regions in Tanzania, Manyara, Dodoma, Morogoro, Iringa, Mbeya, and Songwe, all in the FtF's ZoI (Fig. 1).

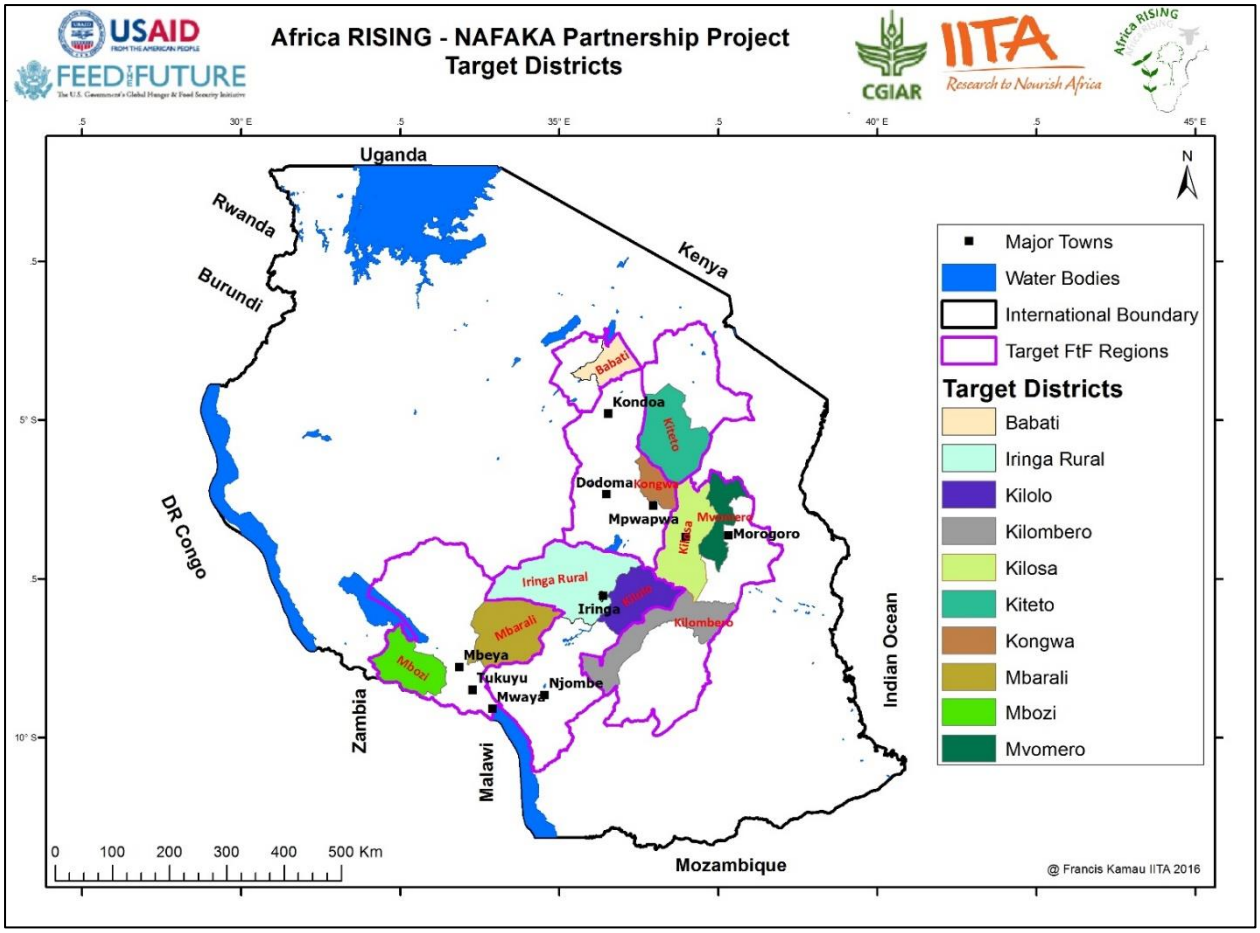

Figure 1: Project locations

All project activities contribute to the Development Objective (DO2) of the USAID Tanzania Country Development Cooperation Strategy (CDCS): inclusive of broad-based economic growth sustained. This is the last year of the project phase and we plan to achieve the Life of Project (LoP) targets of 58,000 ha under improved technologies, 47,000 households benefiting from the project interventions, 47,200 beneficiaries trained, and 200 organizations benefiting from our project activities.

2.2 Implementation status and planned activities

2.2.1 Training of farmers

Training of farmers was the main activity in this quarter. The maize/legumes team conducted training in all the (seven) districts focusing on the following topics: (i) recommended cropping practices (such as timely planting, spacing, thinning, intercropping, crop rotation and use of crop residues); (ii) use and handling of agrochemicals (fertilizers, pesticides, etc.); (iii) recommended soil and water management interventions; (iv) integrated pest management; and (v) proper harvesting. The training was conducted jointly by Africa RISING, NAFAKA, Government extension staff, and village-based agricultural agents (VBAAs). In total, 10,912 farmers (5,749 male, 5,163 female) were trained during the reporting period on maize/legumes-related activities in seven districts (Table 1).

The Africa RISING/NAFAKA Quality Declared Seeds (QDS) program continued to provide on-site training on the management of farmers' fields (total, 80). Additionally, staff

continued to facilitate field inspection visits ensuring that all activities are compliant with the policies of the Government of Tanzania.


Farmers being trained on proper fertilizer placement in Tubugwe village, Kongwa District. Photo credit: Flavian Fortunatus/ACDI VOCA.

For rice, trainings on GAPs (fertilizer use, management of water, also of pests and diseases) were conducted in Mbarali District. The training activities were conducted by Government extension staff and VBAAs, with support from technical staff from Africa RISING and NAFAKA. In total, 5,928 farmers (3,532 male, 2,396 female) were trained in this quarter.

Vegetable activities were mainly concentrated in Kilolo, Mbeya rural, and Iringa regions focusing on training on transplanting of seedlings, and GAPs. In total, 1,593 farmers were trained in the three districts (596 male, 997 female). These activities were conducted jointly with Africare (USAID-funded Mwanzo Bora Nutrition Program in Kilolo district) and CRS (in Mbeya Region). In addition to training, 451 seed kits were distributed in Kilolo District and 1,141 in Mbeya Region to support the seed systems in the target regions.

Government of Tanzania officials (Tanzania Official Seed Certification Institute - TOSCI) inspecting one of the project QDS plots in Mbozi District. Photo credit: Filbert Mzee/ACDI VOCA.

Training on postharvest management practices (hermetic storage technique, motorized shelling machines for labor-saving, and improved drying (use of collapsible drier cases) was conducted by the postharvest team with 83 farmers (24 male, 59 female) in Kongwa District. Training on management of aflatoxins was also conducted in two districts. In Kongwa District, 70 female farmers were trained on GAPs for the management of aflatoxins in groundnut and maize and another 51 farmers were trained on the use of Aflasafe (38 male, 13 female). Table 1 provides a summary of all the training activities conducted in the current quarter.

Table 1. Farmer training activities by enterprise.

Crop Enterprise	**District(s)**	**Number trained quarter 3**		
		Male	**Female**	**Total**
Maize	Babati	200	330	530
	Kilosa	657	352	1,009
	Kiteto	471	488	959
	Kongwa	530	396	926
	Kilolo	725	475	1,200
	Iringa rural	1014	797	1,811
	Mbozi	1,190	1,231	2,421
	Mvomero	962	1,094	2,056
Subtotal		**5,749**	**5,163**	**10,912**
Rice	Mbarali	3,532	2,396	5,928
Subtotal		**3,532**	**2,396**	**5,928**
Post-harvest and aflasafe	Kongwa	24	129	153
	Kiteto	38	13	51
Subtotal		**62**	**142**	**204**
Vegetables	Kilolo	140	312	452
	Mbarali and Mbeya rural	456	685	1,141
Subtotal		**596**	**997**	**1,593**
Total		**9,939**	**8,698**	**18,637**

2.2.2 Training for extension staff and artisans

During the current reporting period, training activities were conducted for Government of Tanzania extension staff. In Kongwa and Kiteto districts, training in field data management as well as aflatoxin management was conducted for 27 Government extension staff (24 male, 3 female). Training on yield data management was also conducted for 13 extension staff in Mvomero District (10 male, 3 female). Finally, in partnership with Polymachinery and SIDO, the project trained 45 fundis (local artisans) (44 male, 1 female) on the maintenance of postharvest machinery (rice and maize shellers and weeders) introduced by the Africa RISING and NAFAKA projects. The training took place in the week 12–16 May 2017 in

Iringa and Morogoro regions. Participants were drawn from eight project districts: Mbozi, Mbarali, Kilolo, Iringa Rural, Kilosa, Mvomero, Kongwa, and Kiteto.


Training extension staff in Kongwa/Kiteto districts on management of aflatoxins in maize and legumes. Photo credit: Elirehema Swai/ARI Hombolo.

2.2.3 Field days

We conducted field days in the districts of Babati, Mbozi, Kongwa, Kiteto, and Kongwa for maize; and in Mvomero and Mbarali for rice. In attendance were farmers, village/district Government extension staff, seed and fertilizer companies, and input supply/retailer companies. In total, 3,611 participants (1,902 male, 1,709 female) took part (Table 2).

Table 2. Field days conducted in project locations.

Enterprise	Location	Number of field days	Total	M	F
Maize	Mbozi	7	702	289	413
	Kiteto	2	474	196	278
	Kongwa	3	550	287	263
	Babati	13	988	658	330
Rice	Mvomero	1	83	38	45
	Mbarali	1	75	35	40
	Iringa	1	74	40	34
	Kilombero	1	97	49	48
Aflasafe	Kongwa	1	568	310	258
TOTAL			**3,611**	**1,902**	**1,709**

During the field days, participants, especially farmers, interacted with different actors in the agricultural sector as well as rate the performance of different technologies that would assist in their adoption decisions for farming activities. For instance, in Babati District, farmers used the following criteria to judge the performance of maize varieties: size and number of cobs, closure of cob on top, rows in a cob, shape and size of grains, sweetness when roasted, stover length, and general healthy appearance of the maize crop and potential for producing quality flour.

A VBAA demonstrating the performance of one of the improved maize varieties during the field day in Mbozi district. Photo credit: Ibrahim Mkwiru/ACDI VOCA.

2.2.4 Problems and challenges

i. Drawing from the experience of the current planting season, most of the country has no climate preparedness, especially as exhibited by water stress resulting from poor rainfall distribution. Thus, in collaboration with Government institutions, a climate-smart strategy that takes into consideration the technologies and practices generated by Africa RISING and partner institutions as well as policy interventions needs to be operationalized in earnest.

ii. Mbuyuni Village in Mbarali District had to be excluded from the pilot villages and the vegetable training activities have been transferred to Maendeleo village not far from Mbuyuni. Farmers in Mbuyuni expected the project to pay for their participation in the training since other projects do so. Since we want to have farmers' true interest in the topic of the training, we declined to pay for their participation.

iii. Delays in getting approval and registration of the aflasafe product for aflatoxin management from the Government of Tanzania have stifled efforts to take the product to scale despite the interest it has aroused among farmers.

2.2.5 Planned activities

The key planned activities for next quarter include the following:

i. Training of farmers in vegetable-related activities, soil and water management, and postharvest management;

ii. Farmer field days;

iii. Annual outcome survey;

iv. End-of-project review meeting for the project;

v. Project planning meeting;

vi. Yield data collection and reporting.

3. INTEGRATION OF CROSS-CUTTING ISSUES AND USAID FORWARD PRIORITIES

3.1 Gender equality and women's empowerment

The project team experienced almost equal participation by male and female farmers in all training activities. The exceptions were vegetable activities (women dominating) and aflatoxin management activities (men dominating). Generally, emphasis is placed on ensuring a balance among the youth, male, and female farmers when selecting Lead farmers, VBAAs, and the hosts of demonstration sites. During training, emphasis is also placed on having this equal participation in the sessions where everyone is encouraged to join in. Sessions must also be scheduled for a time when all interested community members can take part.

We have also noted some unique community arrangements which encourage female participation. These will be further harnessed. For instance, for vegetable activities, participation by women in Mbarali and Mbeya rural was over 60% on average. The main reason for the high participation of female farmers in our training activities is the previous training activity of the Catholic Relief Services' (CRS) in those villages. CRS has conducted training on nutrition with a strong focus on women with children under five years.

Interestingly, for maize/legume activities in Babati District, we are mainstreaming gender in the formulation, planning, implementation, monitoring, and evaluation of interventions and technologies. This involves understanding the underlying drivers of gender inequalities while providing inclusive access to training and information in communities. For example, variety rankings in the 13 communities were conducted separately by men and women with some noticeable gender differences. The attributes used in the ranking of maize varieties were size and number of cobs, closure of cob on top, rows in a cob, shape and size of grains, sweetness when roasted, stover length, and the general healthy appearance of the maize crop and potential for producing flour.

Gender-based rankings revealed differences in terms of attributes used to rank performances for both fertilizers and maize varieties. Women seemed to concentrate on nutritional value and quantity (cob and grain attributes) first before the other attributes; men seemed to concentrate on quality first in terms of prosperity and appearance of the whole crop (height and size of stover/plant).

3.2 Youth engagement

The project has taken initiatives to support youth engagement. In the 2015/16 project year, we piloted the approach of identifying the youth in Msufini Village, Mvomero District (2 males, 2 females) who received training on pest and disease management at Ilonga Agricultural Training Institute, Kilosa District. These young people are actively engaged in providing services in the neighboring villages. In addition, members of two youth groups in Mvomero District, Umoja ni Ushindi (20 members, Hoza Village) and Vijana-Kwadoli (25 members, Kwadoli Village) were specifically supported and linked to a soybean value chain project (Soya ni Pesa), led by CRS in Tanzania.

3.3 Local capacity development

As in the previous quarters, the project continues to work with Government agricultural extension staff at district and village levels. In addition, AR and NAFAKA's collaboration continues to support and train VBAAs who not only complement extension staff trainings but play a key role as frontline actors in the rural agro-input dealer network. In addition, the project works with farmers' groups and associations whose capacities are developed in GAPs and related technical areas.

3.4 Integration and collaboration

By design, the NAFAKA partnership continues to coordinate working together in 9 out of the 11 Africa RISING-supported supported districts. In addition, we have successfully sought collaboration with CRS and Africare (Mwanzo Bora Nutrition Program) in Iringa Region on vegetables. The collaboration with both NGOs is very successful and contributes to the training in many aspects. CRS and Africare contribute largely to the monitoring of the ongoing training activities in the villages and introduce additional nutrition messages to the training program. Due to this successful collaboration, the WorldVeg/HORTI Tengeru project team was able to reach more than 2,700 farmers in this project year.

3.5 Sustainability

The close collaboration with the district agricultural extension services and with NGOs (CARITAS, Africare, and CRS) aims at linking the farmers to partners and development initiatives that will provide support beyond the life of the project. In collaboration with the NAFAKA project, the team works with VBAAs and selected Lead farmers who manage demonstration plots, provide access to inputs, and produce QDS for legumes and rice to sustain the availability of varieties being taken to scale. Furthermore, the project team plans to continue linking local input and other service providers (e.g., machinery, crop insurance) with farmers and local extension staff to ensure the technologies continue to be accessible after the project ends.

3.6 Environmental compliance

In accordance with the project PERSUAP and other guidelines, the team emphasizes judicious use of agro-inputs by promoting integrated soil fertility management without damaging the natural resource base. In semi-arid locations, we encourage farmers to use improved in-situ water conservation technologies such as tied ridges. Management technologies for soils on steep slopes or those affected by high salinity and calcium content underlie the approach used in this project. Given the increase in problems of water availability for production, we emphasize the importance of using organic manure and minimizing the use of water in rice production. This is done by promoting the water-saving technologies and establishing bunds around paddy plots in rice, among others.

3.7 Global climate change

Unpredictable weather, especially rains affected the progress of project activities in most districts.

3.8 Policy and governance support

The project activities are in line with the Government policy of fostering agricultural development. Consequently, the team has got tremendous support from district and village local governments in all areas where the project activities are implemented.

3.9 Private sector engagement, Public Private Partnerships (PPP), and Global Development Alliance (GDA) collaboration

The project works directly with two agro-input/seed companies registered in Tanzania – Meru Agro Seed Company and Consultancy and Aminata Agro Seed Company. Their staff has been instrumental in providing guidance on seed-related matters as well as participating in the rural agro-input network spearheaded by the NAFAKA project.

For vegetables, joint testing of small-scale screen houses by WorldVeg/HORTI Tengeru and a private company (A to Z Textiles) is ongoing with farmer groups in five villages in Babati District.

Through the Soya ni Pesa project implemented by CRS and a local NGO in Mvomero District, WOPATA (Women and Poverty Alleviation in Tanzania), the project is working with about 200 farmers in nine villages to provide an opportunity for getting access to a good market for soybean.

3.10 Science, technology, and innovation

The vegetables team continues to work on a screen house prototype together with A to Z Textiles, a private company dealing in agronets. The team will further start a comparison of the small-scale net house with two different kinds of shade nets (50% and 30%) on the campus of the World Vegetable Center in Arusha to identify the impact of shade nets and screen from the net house on the yield and the quality of the crops. This will help to identify best performing varieties and technologies (shade net or net house) that will be used for further participatory trials in the pilot villages.

4. STAKEHOLDER PARTICIPATION AND INVOLVEMENT

See sections 3.3 and 3.4.

5. MANAGEMENT AND ADMINISTRATIVE ISSUES

No issues.

6. MONITORING, EVALUATION, AND LEARNING

The PMP indicators are presented in Annex 1. The project team also plans to develop and conduct research on USAID Collaborative Learning and Adaptation (CLA) questions with NAFAKA. Two of the key learning questions being discussed with NAFAKA are as follows:

1. To what extent does training at demos and the provision of small packs influence farmers' decisions to buy inputs, either from the established rural agro dealer networks or other agro-input sources?
2. What are the drivers of farmers' choices of technologies (e.g., maize varieties and GAPs) from among those promoted by the project?

In addition, the vegetables team conducted an impact study in the 2014/15 villages of the project (nine) in the districts of Babati, Kiteto, and Kongwa. The study was conducted during January and February 2017. A total of 403 quantitative interviews with male and female vegetable producers were conducted. Out of the 403 respondents, 200 were beneficiaries that participated in the training activities and received a seed kit; 203 (control) did not receive a seed kit or participate in the training. The beneficiaries and the control group surveyed were all from the same villages and operated under the same environmental and market conditions.

The survey also included a comparison of the yields of four different vegetable crops scaled out by the project (tomato, African eggplant, amaranth, and African nightshade), as well as a crop that has not been introduced as part of the seed kits, but which was included in the practical production training activities (Ethiopian mustard). The comparison did not include jute mallow since this crop had been adopted by only a small number of beneficiaries and was not cultivated by the control group.

Figure 2 compares the yields of five different vegetable crops that were achieved by beneficiaries and non-beneficiaries. Beneficiaries had tomato yields that were on average 14% higher than those from non-beneficiaries. For African nightshade (56%) and for African eggplant (103%), the yields from beneficiaries were significantly higher than those realized by non-beneficiaries. There was no significant yield difference for amaranth.

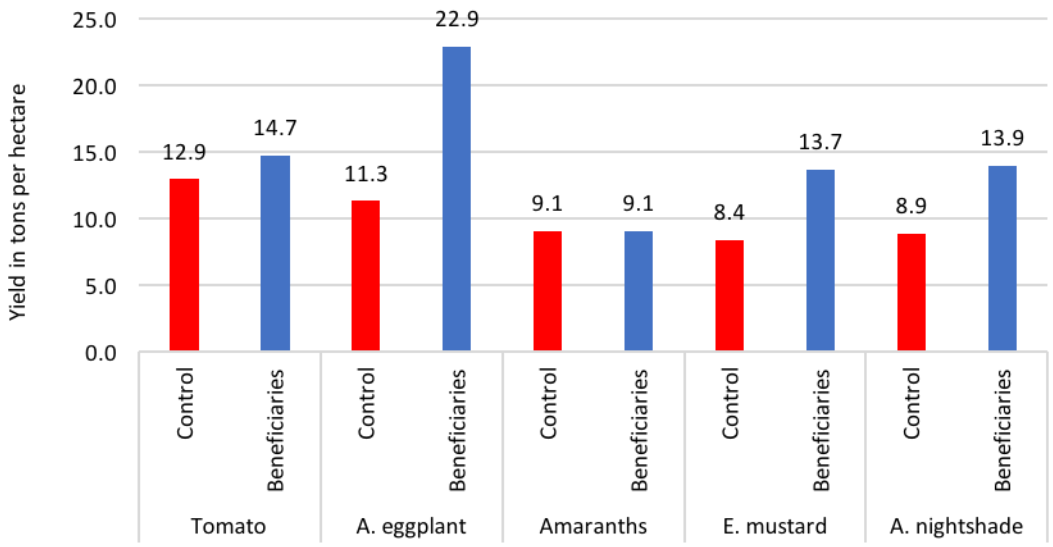

Figure 2. Comparison of the yields obtained by beneficiaries and non-beneficiaries (control) in the nine pilot villages (yield data from 2016).

Figure 3 compares the yields of beneficiaries for specific crops in 2014 and 2016. Under similar weather conditions in 2014 and 2016, as stated by all respondents in the questionnaires, yields for all four crops scaled out by the project were significantly higher in 2016 than in 2014. Therefore, although we were not able to exclude all factors that might have had an impact on farmers' vegetable yields, the fact that the yields of beneficiaries were significantly higher, and that their yields were higher in 2016 compared to the last season before the training activities were implemented lets us assume that the project intervention had a positive effect on farmers' yields.

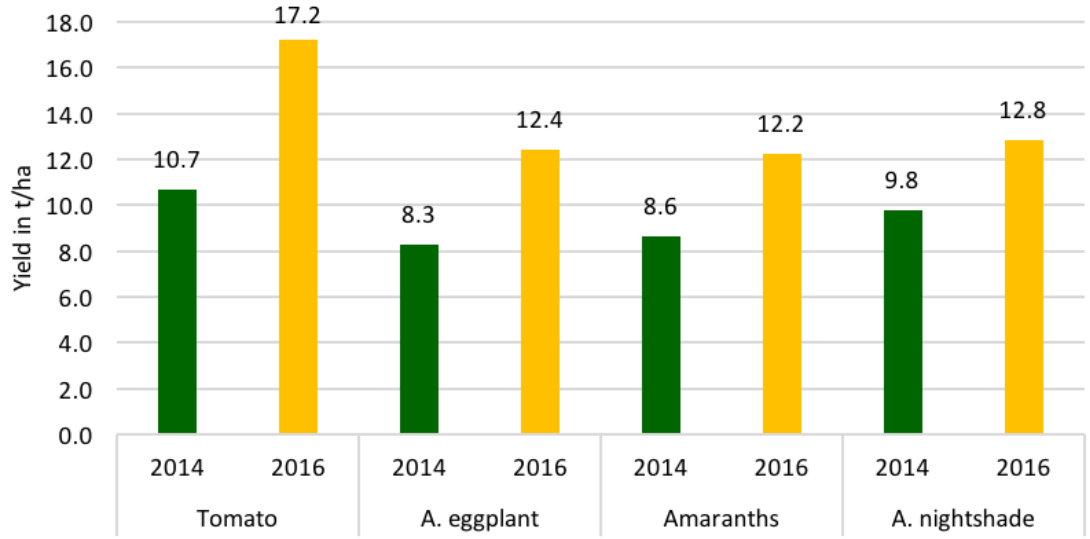

Figure 3. Comparison of beneficiaries' yields for specific crops in 2014 and 2016.

Figure 4 provides a comparison of the total production costs, total revenues, and their gross margin in Tanzanian Shillings/ha. Except for African nightshade, the gross margins for all other vegetable crops were significantly higher for beneficiaries than for non-beneficiaries. The gross margin of beneficiaries for tomato was even 26% higher than the tomato gross margin of non-beneficiaries. For Ethiopian mustard, beneficiaries realized and increased the gross margin but also increased direct production costs. The increase of costs results from

significantly higher labor costs due to the possibility of harvesting several times. Non-beneficiaries were able to harvest only once or twice from the same crop.

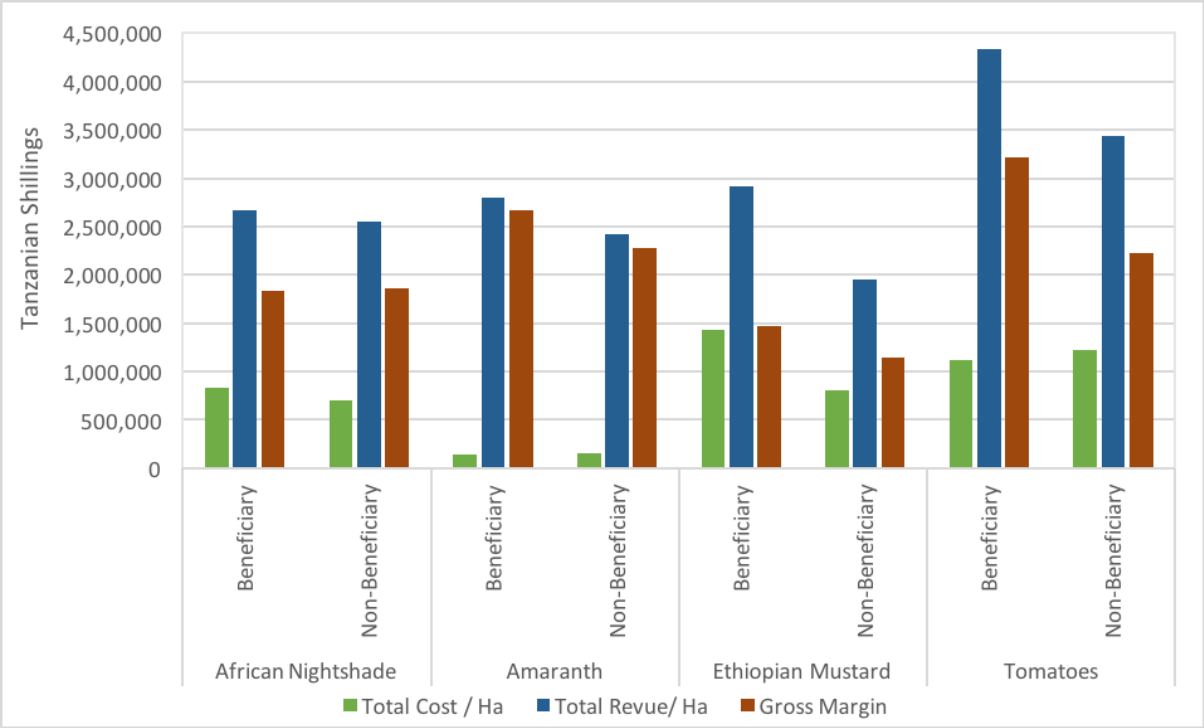

Figure 4. Comparison of total production costs, total revenues, and gross margin of beneficiaries and non-beneficiaries (Tanzanian Shillings/ha).

7. SPECIAL EVENTS FOR NEXT QUARTER

None.

8. ANNEXES

8.1 Annex I. Performance against PMP indicators for Project Year III (2016/17)

Indicator / Disaggregation	Target 2017	Qr1 (Oct-Dec 2016)			Qr2 (Jan- Mar 2017)			Qr3 (Apr – Jun 2017)			Qr4 (Jul – Sept 2017)
		With NAFAKA	Africa RISING (AR) only	**Total**	With NAFAKA	AR only	**Total**	With NAFAKA	AR only	**Total**	
EG.3-1: (4.5.2-13) Number of households benefiting directly from USG interventions (RAA)	47,000	5,383	3,872	**9,255**	34,157	1,969	**36,126**	10,746	2,300	**13,046**	
New/Continuing											
New	39,392	651	996	1,647	28,774	1,969	30,743	10,746	1,608	12,354	
Continuing	7,608	4,732	2,876	7,608	5,383	-	5,383	-	692	692	
Location											
Rural	47,000	5,383	3,872	9,255	34,157	1,969	36,126	10,746	2,300	13,046	
Urban/Peri-urban											
EG.3.2-1: (4.5.2-7) Number of individuals who have received USG-supported short-term agricultural sector productivity or food security training (RAA) (WOG)	47,200	1,152	1,374	**2,526**	40,203	2,161	**42,364**	15,437	3,285	**18,722**	

Type of Individual											
Producers	47,000	1,024	1,341	2,365	40,184	1,969	**42,153**	15,352	3,285	**18,637**	
Male	23,500	509	667	1,176	20,259	1,299	**21,558**	8,462	1,477	9,939	
Female	23,500	515	674	1,189	19,925	670	**20,595**	6,890	1,808	8,698	
People in Government	160	122	33	155	19	192	**211**	40	-	**40**	
Male	90	98	24	122	12	147	**159**	34	-	34	
Female	70	24	9	33	7	45	**52**	6	-	6	
People in private sector firms	40	6	-	6	-	-	-	45	-	**45**	
Male	20	5		5	-	-	-	44	-	44	
Female	20	1		1	-	-	-	1	-	1	
People in civil society							-	-	-	-	
Male					-	-	-	-	-	-	
Female					-	-	-	-	-	-	
EG.3.2-4: (4.5.2-11) Number of for-profit private enterprises, producers' organizations, water users' associations, women's groups, trade and business associations, and community based organizations (CBOs) receiving USG food security related organizational development assistance (RAA) (WOG)	200	161	18	**179**	175	21	**196**	196	35	**231**	

Type of organization											
For-profit private enterprises	3	2	1	3	2	1	3	2	1	3	
Producers organizations	197	143	11	154	157	14	171	178	28	206	
Water users' associations		16	-	16	16	-	16	16	-	16	
Women's groups											
Trade and business associations											
Community-based organizations (CBOs)			6	6		6	6		6	6	
*EG.3.2-17: (4.5.2-5) Number of farmers and others who have applied improved technologies or management practices with USG assistance (RAA) (WOG)	47,000										
*EG.3.2-18: (4.5.2-2) Number of hectares of land under improved technologies or management practices with USG assistance (RAA) (WOG)	58,000										

*These indicators are measured annually. Therefore, data for 2016/17 will be available in the last quarter of the project year.

8.2 Annex III: Success stories

Tanzania Minister of Agriculture, Livestock and Fisheries praises Africa RISING-NAFAKA project scaling model in enhancing research–extension linkages

Hon Dr Charles Tizeba, Tanzania's Minister for Agriculture Livestock and Fisheries (far left) when he visited the Africa RISING Project farmer demonstration site at Kigugu Irrigation Scheme in Mvomero District. He is flanked by (from left to right): Dr Firmin Mizambwa, Chief Executive Officer of Agricultural Seed Agency; Dr Kissa Kajigili Director of Agricultural Extension, Dr Sophia Kashenge, Africa RISING-NAFAKA Project Rice Team Leader; Ms Neema Mkanga Extension Officer, Kigugu Village, and Dr Kebwe Stephen Kebwe, Regional Commissioner Morogoro Region.

The Africa RISING-NAFAKA project's model for scaling and disseminating improved technologies has been lauded as "exemplary" and the kind of approach needed to ensure sustainability of improved agricultural interventions for farmers by Tanzania's Minister of Agriculture Livestock and Fisheries, Hon Dr Charles Tizeba.

The Minister made the remarks during his visit to the Africa RISING-NAFAKA Project demonstration site at Kigugu Irrigation scheme in Mvomero District on 28 June 2017. He further lauded the model for being a demand-driven one that ensures involvement of various stakeholders and encouraged other interventions working at the local level with extension officers and farmers to consider adopting the same approach.

"I urge all researchers and other stakeholders in agriculture to ensure that they provide extensive training to these extension officers for sustainability of agricultural

interventions," said Hon Tizeba after he was impressed by the depth of knowledge exhibited by the Village Agricultural Extension Officers (VAEOs) who responded to the technical questions he asked during the visit.

The Africa RISING-NAFAKA project approach involves VAEOs as an integral part of the process in promoting improved rice production technologies among farmers. The scaling model involves introduction of the technologies in the communities using mother–baby–grandbaby demonstration sites which serve as training/learning sites for extension staff and farmers. Extension staff and lead farmers undergo season-long training using the sites and they then train other farmers in a cascading mode, backstopped by staff from participating research and development institutions (Fig. 1). Key principles that guide the process to make it successful include: international research institutions working with the national research institutions at all sites; close linkage and working with development partners, both government and non-government/private, that may be implementing activities in and around the project site; leveraging resources among participating institutions; close collaboration with District Agricultural Extension Officers, Ward Agricultural Extension Officers, and Village Agricultural Extension Officers; use of Geographical Information Systems for better targeting of interventions; and ensuring regular communication via different modes (WhatsApp groups, reports, meetings) among stakeholders—farmers, implementing partners, government, and donors.

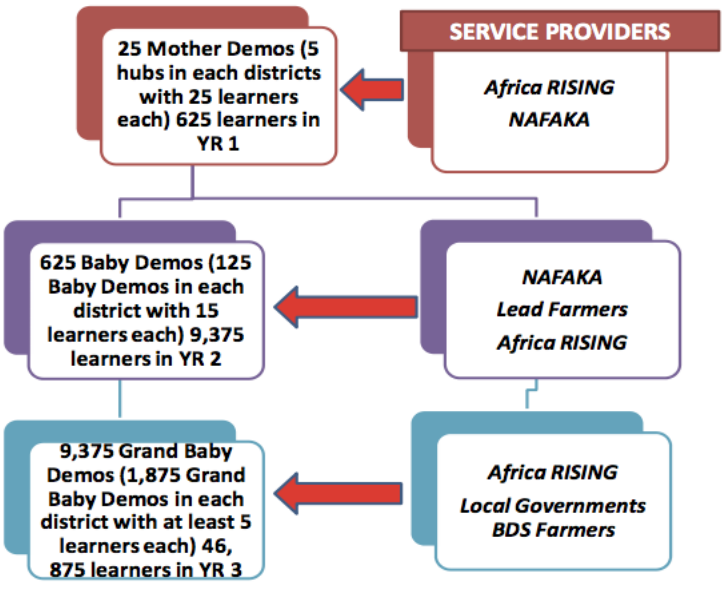

***Figure** 1. The research and development model for innovation delivery and scaling as applied by the Africa RISING-NAFAKA Project for rice technologies.*

Through the USAID-funded Africa RISING-NAFAKA Project, Dakawa Agricultural Research Institute (ARI- Dakawa) is leading implementation of activities to improve rice productivity in Tanzania's Mvomero, Kilombero, Iringa Rural, and Mbarali districts. The project's aims are three-fold: Ensuring that at least 47,000 smallholder farm households in rural Tanzania can access technologies to diversify and increase their food supply and income sources, and improve the quality of degrading

smallholder cropland; expanding the area under improved crop production technologies by at least 58,000 hectares; and increasing the yields of both maize and rice by 50% as a result of the technologies being applied.

Changing tack in extension so technologies tick the right boxes for farmers to take root

A self-organized field day led by the extension agents underway in Babati District. Photo credit: Job Kihara/CIAT

One of the major paradoxes confounding actors in agricultural research and development today is: Why, in several instances, don't smallholder farmers adopt agricultural innovations and technologies that have been validated through rigorous scientific processes despite their (obvious) ability to improve livelihoods? While various arguments have been made on a technology-by-technology basis, one aspect that is always a starting point has always been: How the technologies were introduced to the farmers (the extension process).

For the past six years, scientists drawn from different national and international research centers, initially working under the USAID-funded Africa RISING program and later under the Africa RISING-NAFAKA project, have been engaged in agricultural research and scaling activities (through participatory approaches) with the goal of improving the livelihoods of thousands of smallholder farmers in 10 districts of Tanzania. While the initial focus of the program (and the scientists) was predominantly on validating the technologies through participatory research with farmers, the team is now working with concerted efforts to take the technologies to scale, targeting thousands of farmers beyond the communities where the validation was done. This greater expectation and focus is changing how the project team is going about the business of agricultural extension.

Babati District, the epicenter of change
During July 2017, Babati District (one of the 10 Africa RISING focus districts in Tanzania) has been a beehive of activity. Extension personnel from the district, ward, and village levels have been holding field days aimed at sharing experiences and lessons learned from project activities. Beyond the pomp and fanfare associated with the events, valuable messages about the technologies and practices are being shared in a practical and user-friendly manner, more importantly, through the most appropriate mediums—the extension staff. Through them, technical messages about improved technologies are almost naturally simplified owing to their ability to "speak the farmers' language".

This wasn't always how Africa RISING farmer field days were organized. Most of the field days were largely researcher-led. So, what occasioned the change in approach from researcher-led field days to extension/village/self-organized field days?

"We realized that researchers can only conduct a few field days and reach a small number of farmers. On the other hand, district, ward, and village extension agents operate and are present in all the villages. We didn't have any facilitation in the past to be able to implement demos and field days in our villages, but now once the scientists have helped us and the farmers to set-up demonstration plots where these improved technologies can be observed, we then take-over to educate our farmers through self-organized field days," explains Jonas Massam, the acting District Agriculture, Irrigation and Livestock Cooperatives Officer for Babati District.

Minimal support, maximum impact
With minimal support from the scientists, the extension agents conducted field days in 13 villages attracting between 35 and 165 farmers at each event. To ensure that they are not spread too thinly when managing a large number of farmers during a field day, the extension agents have also established a mechanism whereby their colleagues from neighboring villages come to help when many farmers are expected.

"The team spirit exhibited by the extension agents is amazing. This kind of effort at the grassroots can quickly transform agriculture for the better. The project will continue to provide basic inputs for many more extension personnel to implement demos especially in locations where farmers normally conduct village meetings. I think this will be a good way of utilizing the existing network and local know-how by the extension personnel for the benefit of farmers," notes Dr Job Kihara, a Senior Scientist with CIAT and an agronomist for the project.

"I think our work over the past six years is paying off in a big way. It is good to persist with this capacity-building effort for extension staff. We have trained them on technology evaluation and participatory economic analysis and it is encouraging to see them now go out on their own and work with farmers during the field days," adds Dr Stephen Lyimo, a Senior Scientist at Selian Agricultural Research Institute and one of the implementing partners of the Africa RISING program.

Consistency in the quality of messaging
Ensuring consistency in the quality of messages and information transmitted from researchers to extension personnel and farmers, and ensuring feedback among actors is key for this approach to be effective. First, the extension workers are

trained by the scientists on the content and presentation of the messages during the cropping season. Second, the scientists attend the field days, not to lead, but rather to back up the extension staff in the event that a technical question they cannot handle comes up. Third, the extension staff are equipped with reference materials, which already have standardized messages and information that should be passed to the farmers. Topics farmers have been trained on during the cropping season and seen demonstrated during the field days led by extension staff so far include: use of improved crop varieties, use of fertilizers especially in fields located on sloping land, appropriate management of farmyard manure, optimum spacing of plants, soil and water conservation measures, and the realization of the economic benefits associated with the promoted technologies.

Fred Kizito, a Senior Scientist with CIAT implementing activities under the Africa RISING-NAFAKA project notes that; "This change of tack is a big deal for us. It is the make or break—without the commitment of our local partners (extension staff), we would not go far. The number of farmers we are reaching now with improved technologies and practices would not be possible and more importantly our impact on the ground would be very limited". This effort is being followed up with ICT messages from the MWANGA platform to farmers on market opportunities for their produce, to extension agents to conduct follow-up activities with, and to the beneficiary farmers.

Gender-sensitive technology dissemination

Adopting a gender-sensitive technology dissemination approach is also a significant aspect of change introduced in this enhancement of extension services by the Africa RISING scientists. For example, a field day that lasts about 3–6 hours is now done in two parts—the first one involves visiting field demos in separate groups of male and female farmers and evaluating the performance of the technologies, with each group noting key observations and lessons. This is followed by a still separate meeting (women and men) involving scoring of the technologies, associated benefits, profitability assessment, and a discussion on key messages for moving forward. This is particularly critical because men's and women's roles, opportunities, and views of technologies are socially constructed and vary across different societies. Having two groups of men and women during the field days therefore helps to ensure that voices of both groups are heard in technology dissemination and fewer gender-biased technologies.

Beyond just getting new technologies into the hands of more farmers, this change in approach to extension is also anticipated to lead to the generation of more gender-sensitive technologies by scientists using the feedback from the two farmer groups, enhanced capacity of extension service in remote villages, as well as a stronger linkage and partnership between the international organizations working in Africa RISING and the NAFAKA programs and the national programs and local partners.